

REMARKS

In an Office Action dated February 21, 2003, claims 1, 4 and 5, all of the claims under consideration in the subject patent application, were rejected. By amendment above, independent claims 1 and 4 have been rewritten. Support for the amendments in claims 1 and 4 can be found on page 6, line 14- page 7, line 12 of the specification.

Reconsideration of this application and allowance of the claims is respectfully requested in view of the foregoing amendments and the following remarks.

The Examiner has rejected claims 1, 4 and 5 under 35 U.S.C. § 102(b) as being anticipated by Sato et al (JP 09-115355). Although the language of the claims has been limited to "consisting essentially of," the Examiner asserts that the prior art Sato reference reads on the claims as the possible inclusion of Mg, Ni and NiO are inclusions in the alloy without altering the properties of the alloy of the invention. Therefore, these are insubstantial inclusions for which the claim language is still open.

Applicants submit that the internal oxidation method, as discussed by Sato et al., is different from the internal oxidation as performed by the method of the current invention. The internal oxidation method as currently claimed in the invention will result in an Ag-alloy which has better properties with respect to the prevention of breaks in the alloy material. The internal oxidation method of the current invention requires the thermal oxidation to occur under a pressure between 3 and 10 atm at 700-800°C. Furthermore, the internal oxidation is carried out on the alloy material prior to its use as "envelop" material for the superconductivity oxide.

However, in Sato et al. hardening by internal oxidation does occur but not at the pressures as in the current application (see Sato paragraph 16). The method of hardening the Ag alloy as disclosed by Sato et al includes heating the alloy in the atmosphere, in which method internal oxidation hardly occurs and hardening is insufficient. Only after such hardening by internal oxidation is the superconductivity oxide with the Ag alloy submitted to a heat treatment at 700-950°C at 0.01-10atm. Such later treatment is not for the purpose of internal oxidation and will not provide the internal oxidation as claimed in the present claims.

Applicants respectfully submit that the claimed invention of independent claims 1 and 4, as amended, is distinguishable from Sato et al and is therefore not anticipated. In addition, as claim 5 is dependent from claim 1, applicants submit that the composite material of claim 5 is not anticipated by Sato et al by virtue of its dependency of claim 1. Withdrawal of the rejection is respectfully requested.

Claims 1, 4 and 5 were also rejected under 35 U.S.C. 103(a) as unpatentable over Tenbrink et al. in view of applicant's own admission.

According to the Examiner Tenbrink teaches an Ag-oxide composite material, which Tenbrink discloses to contain 0.1-0.25 wt%, in terms of elemental metal, of an oxide of Mg and 0.1-0.25 wt%, in terms of elemental metal, of an oxide of Ni. The Examiner further asserts that the references teaches that the alloy is subjected to dispersion hardening by oxidation. Further, according to the Examiner applicants have admitted in the specification that auxiliary material for use with a superconductive material is formed into a tape or pipe and then a multilayer composite structure is formed wherein Ag-metal oxide composites have been used as a

superconductor auxiliary material. Therefore, according to the Examiner it would have been obvious to utilize the Ag-metal oxide composite material of Tenbrink for the superconductor auxiliary material because Tenbrink provides an alloy with a coefficient of thermal expansion matched for use with a ceramic compound wire rod.

The invention of the present application, as claimed in claims 1 and 4, as amended, requires internal oxidation of the Ag-metal composite material, wherein the internal oxidation is performed at a pressure of 3-10 atm at 700-800°C. This internal oxidation will result in a superior Ag-metal oxide material with respect to possible breaks in the alloy material. Thus, the current invention differs substantially from Tenbrink as this prior art reference does not use internal oxidation at the increased pressure of 3-10atm. It is not obvious from the prior art that such an internal oxidation of the metal alloy would result in a superior Ag-alloy which is less likely to include breaks.


Applicants respectfully submit that the claimed invention in claims 1 and 4, as amended, therefore is not obvious over Tenbrink et al (JP 06-045132) combined with applicants own statements in the specification. In addition, as claim 5 is dependent from claim 1, applicants submit that the composite material in claim 5 is not obvious by Sato et al by virtue of its dependency of claim 1. Withdrawal of the rejection is respectfully requested.

Finally, the Examiner noted that while determining the presence of free Mg and Ni in the material of the present invention the Examiner noticed what appears to be an error in the specification in Table 1 (page 11). Applicants, submit that the Examiner correctly pointed out an error in Table 1 with respect to Examples 1 and 2. In the table the values for Mg/MgO and Ni/NiO for both Example 1 and 2 after oxidation were inadvertently transposed. Applicants, request replacement of the Table 1 on page 11 of the specification with the corrected table as

shown, which is submitted on a separate sheet. Applicants submit that by replacing Table 1 on page 11 of the specification with the corrected table as shown no new matter has been added to the specification.

Applicants submit that the present application is now in condition for allowance.

Reconsideration and favorable action are earnestly requested.

RESPECTFULLY SUBMITTED,					
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Amended Claims 1 and 4: Version with markings to show changes made

1. (Thrice Amended) A composite material, wherein said composite material consists essentially of an Ag alloy material in a pipe or tape form and a superconductive material, wherein said Ag alloy material at least partially encloses the superconductive material, and wherein said Ag alloy material consists essentially of Ag as a base material and MgO, wherein the MgO is dispersed in Ag base material and formed through the process of internal oxidation, wherein said MgO is 0.03 to 3.3 wt% of the Ag alloy material, the balance being Ag, wherein said internal oxidation is performed at a pressure of 3-10 atm at 700-800°C.

4. A composite material, wherein said composite material consists essentially of an Ag alloy material in a pipe or tape form and a superconductive material, wherein said Ag alloy material at least partially encloses the superconductive material, and wherein said Ag alloy material consists essentially of Ag as a base material, and MgO and NiO, wherein the MgO and NiO are dispersed in the Ag base material and are formed in the Ag base material through the process of internal oxidation, wherein MgO is 0.01 to 1.7 wt%, NiO is 0.02 to 1.3 wt% of the Ag alloy material, the balance being Ag, wherein said internal oxidation is performed at a pressure of 3-10 atm at 700-800°C.

Table 1

		Composition		Tensile strength (MPa)	Hardness (Hv)	elongation (%)	Young's modulus ($\times 10^4$ MPa)	Specific resistance ($\times 10^8 \Omega m$)
		Mg MgO	Ni NiO	finished pipe	finished pipe	finished pipe	finished pipe	finished pipe
Example 1	before oxidation	0.10	0.10	510	95	1.0	3.45	2.40
	after oxidation	<u>0.17</u>	<u>0.13</u>					
Example 2	before oxidation	0.05	0.05	480	88	1.5	3.20	2.20
	after oxidation	<u>0.08</u>	<u>0.06</u>					
Example 3	before oxidation	1.00	0.40	570	110	0.8	3.60	2.50
	after oxidation	1.65	0.51					
Example 4	before oxidation	1.00	-	560	105	0.9	3.55	2.45
	after oxidation	1.62	-					